# REMARKS

## Statement of Substance of the Interview

Examiners Jeff Wollschlager and Stella Yi had a telephone interview with Applicant's representative, Patent Agent, Xiaobin You, on August 25, 2010. During the telephone interview, the differences between the amended claims and the prior art were discussed. The Examiners indicated that the added time formulas in claims 1, 11 and 16 are indefinite because they fail to specify the units of the time, viscosity, length, radius, interface free energy and contact angle, and suggested to file a Supplemental Amendment.

This Supplemental Amendment is submitted to address the Examiners' concerns.

## Summary of the Office Action

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishikawa et al. (US 6,063,527) and in view of XIA et al. ("Soft Lithography." Angew. Chem. Int. Ed., 1998, pp. 550-575) and in further view of Song et al. (US 2001/0019382).

## Summary of the Response to the Office Action

Applicant has amended the Specification to improve its form. No new matter has been added. Accordingly, claims 1-20 remain pending for further consideration.

## All Claims Define Allowable Subject Matter

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over

Hishikawa, XIA and Song. Applicant respectfully traverses these rejections for at least the

following reasons.

Independent claim 1, as amended, recites a method of forming a color filter layer

including, in part, "... wherein the first time is determined by $t1 = (2\eta 1 z1^2)/(R1\gamma 1\cos\theta 1)$, where

$t1$ is the first time, $\eta 1$ is a viscosity of the first color resin, $z1$ is a length of the first channel, $R1$

is a hydraulic radius of the first color resin, $\gamma 1$ is an interface free energy between the first color

resin and an air, and $\theta 1$ is a contact angle between the first color resin and the first mold; ...

wherein the second time is determined by $t2 = (2\eta 2 z2^2)/(R2\gamma 2\cos\theta 2)$, where $t2$ is the second

time, $\eta 2$ is a viscosity of the second color resin, $z2$ is a length of the second channel, $R2$ is a

hydraulic radius of the second color resin, $\gamma 2$ is an interface free energy between the second

color resin and the air, and $\theta 2$ is a contact angle between the second color resin and the second

mold; ... wherein the third time is determined by $t3 = (2\eta 3 z3^2)/(R3\gamma 3\cos\theta 3)$, where $t3$ is the

third time, $\eta 3$ is a viscosity of the third color resin, $z3$ is a length of the third channel, $R3$ is a

hydraulic radius of the third color resin, $\gamma 3$ is an interface free energy between the third color

resin and the air, and $\theta 3$ is a contact angle between the third color resin and the third mold ...."

Independent claim 11, as amended, recites a method of forming a color filter layer

including, in part, "... wherein the first time is determined by $t1 = (2\eta 1 z1^2)/(R1\gamma 1\cos\theta 1)$, where

$t1$ is the first time, $\eta 1$ is a viscosity of the first color resin, $z1$ is a length of the first channel, $R1$

is a hydraulic radius of the first color resin, $\gamma 1$ is an interface free energy between the first color

resin and an air, and $\theta 1$ is a contact angle between the first color resin and the first mold ...

wherein the second time is determined by $t2 = (2\eta 2z2^2)/(R2\gamma 2\cos\theta 2)$, where $t2$ is the second time, $\eta 2$ is a viscosity of the second color resin, $z2$ is a length of the second channel, $R2$ is a hydraulic radius of the second color resin, $\gamma 2$ is an interface free energy between the second color resin and the air, and $\theta 2$ is a contact angle between the second color resin and the second mold ... wherein the third time is determined by $t3 = (2\eta 3z3^2)/(R3\gamma 3\cos\theta 3)$, where $t3$ is the third time, $\eta 3$ is a viscosity of the third color resin, $z3$ is a length of the third channel, $R3$ is a hydraulic radius of the third color resin, $\gamma 3$ is an interface free energy between the third color resin and the air, and $\theta 3$ is a contact angle between the third color resin and the third mold ...."

Independent claim 16, as amended, recites a method of fabricating a color filter substrate for a liquid crystal display device including, in part, "... wherein the first time is determined by $t1 = (2\eta 1z1^2)/(R1\gamma 1\cos\theta 1)$, where $t1$ is the first time, $\eta 1$ is a viscosity of the first color resin, $z1$ is a length of the first channel, $R1$ is a hydraulic radius of the first color resin, $\gamma 1$ is an interface free energy between the first color resin and an air, and $\theta 1$ is a contact angle between the first color resin and the first mold ... wherein the second time is determined by $t2 = (2\eta 2z2^2)/(R2\gamma 2\cos\theta 2)$, where $t2$ is the second time, $\eta 2$ is a viscosity of the second color resin, $z2$ is a length of the second channel, $R2$ is a hydraulic radius of the second color resin, $\gamma 2$ is an interface free energy between the second color resin and the air, and $\theta 2$ is a contact angle between the second color resin and the second mold ... wherein the third time is determined by $t3 = (2\eta 3z3^2)/(R3\gamma 3\cos\theta 3)$, where $t3$ is the third time, $\eta 3$ is a viscosity of the third color resin, $z3$ is a length of the third channel, $R3$ is a hydraulic radius of the third color resin, $\gamma 3$ is an interface free energy between the third color resin and the air, and $\theta 3$ is a contact angle between the third color resin and the third mold ...."

As described in [0035] of the specification of the present invention, the time for filling up the channel with the resin may be determined by the equation of $t = (2\eta 1 z^2)/(R 1 \gamma 1 \cos\theta)$, where the unit of the filling time (t) is second (sec), the unit of viscosity ($\eta$) of the resin is poise (P = g/cm*sec), the unit length (z) of the channel is cm, the unit of the hydraulic radius (R) of the resin is cm, the unit of interface free energy ($\gamma$) between the resin and air is erg/cm$^2$ (= {g*(cm/sec$^2$)*(cm}/cm$^2$, = g/sec$^2$), and the unit of the contact angle ($\theta$) between the resin and the mold is degree (°).

The first, second and third times for filling up the first, second and third channels with the first, second und third color resins may be determined by the above equations. The first, second and third color resins may have different viscosities, hydraulic radii, interface free energies and contact angles from one another. As a result, the first, second and third times for the first, second and third color resins may be differently determined even when the first, second and third channels have the same lengths as one another,

Specifically, the first channel has two sidewalls of the mold, while each of the second and third channels has one sidewall of the mold and the other sidewall of the color filter. Thus, the first, second and third color resins have difference contact angles as one another. As a result, the first time for the first color resin may be differently determined from each of the second and third times for the second and third color resins even when the first, second and third channels have the same lengths as one another and the first, second and third color resins have the same viscosity and hydraulic radius, interface free energy as one another.

Since the first time is different from each of the second and third times due to the difference in sidewalls between the first channel and each of the second and third channels,

Applicant respectfully submits that <u>Hishikawa</u>, <u>XIA</u> and <u>Song</u>, whether taken individually or in combination, fail to teach or disclose the above claimed equation recited in each of independent claims 1, 11 and 16. In other words, <u>Hishikawa</u>, <u>XIA</u> and <u>Song</u>, whether taken individually or in combination, fail to teach or disclose at least the above-noted features of the claimed invention. Accordingly, Applicant respectfully submits that independent claims 1, 11 and 16, and their dependent claims 2-10, 12-15 and 17-20, are allowable over the cited references.

## CONCLUSION

In view of the foregoing, Applicant respectfully requests reconsideration and timely allowance of the pending claims. Should the Examiner believe that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution. If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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Dated: September 16, 2010

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